

Retrospective Study of Facial Fractures Fixation Outcome in Al-Azhar University Hospitals (El-Hussein and Bab-Elsharia)

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ABSTRACT

Background: maxillofacial fractures incidence varies between different nations, mandibular fractures are the most common, multidisciplinary approach is often required, and early consultation with other specialties is recommended also understanding of common posttraumatic complications will guide surgical management.

Aim of the work: to analyze the outcome of maxillofacial fractures fixation helping optimization of surgical practice and medical service appraisal.

Patients and Methods: the data were retrospectively collected from the medical records of 76 cases treated at Plastic Surgery Department, Al-Azhar University, from 2014 to 2017 and patients were examined as full maxillofacial examination.

Results: the total number of patients with maxillofacial trauma presenting to Plastic Surgery Department, during the period from 2014 to 2017 was 76 patients. Males were more frequently affected than females, where males accounted for 92.1% (70 patients) and females accounted for 7.9% (6 patients) of the study population. The ages of the patients ranged from 4 to 61 years, with a mean of 24.84 ± 10.57 years. Road traffic accident (RTA) was the most common cause of trauma, 42.1% of cases. A total of 43 (56.5%) cases had mandibular fractures. Most of the fractures were treated by means of open reduction and internal fixation using plates (67 cases; 88.2%), whereas 6 (7.9%) cases were treated by means of closed reduction and maxillo-mandibular fixation and 3 (3.9%) were treated by splinting.

Conclusion: the main etiological factor in maxillofacial injuries is RTA with males between 11 and 30 years of age being affected predominantly.

Keywords: retrospective study, maxillofacial fractures, maxillofacial trauma.

INTRODUCTION

Maxillofacial fractures are resulting from different types of trauma to the face, and may occur in isolation or combined with other injuries⁽¹⁾.

Maxillofacial fractures incidence varies widely between different nations depending on, local demographic and socioeconomic status, generally, the incidence is higher in males than in females with peak incidence between 20 and 30 years⁽²⁾.

Facial fractures have many causes; however, traffic accidents, assaults, falls, and sport injuries, road traffic accidents have always been the most frequent cause of facial fractures worldwide⁽³⁾.

The main cause of injury in Egypt is due to road traffic accidents followed by gunshot and fall from height⁽⁴⁾.

Mandibular fractures are the most common among all other sites followed by zygomaticomaxillary fractures and nasal fractures, however, this is not corresponding with other studies that found that nasal bones and zygomaticomaxillary complex the most common

site of injury due to their prominent position within the facial skeleton⁽⁴⁾.

Multidisciplinary approach is often required, and early consultation with other specialties is recommended also understanding of common posttraumatic complications will guide surgical management⁽⁵⁾.

The management of maxillofacial fractures remains a challenge, demanding both skill and experience, the main aims of fracture management are; to anatomically reduce the fractures, adequately stabilize them to allow healing, restore pre injury function and to avoid complications⁽⁶⁾.

AIM OF THE STUDY

To analyze the outcome of maxillofacial fractures fixation helping optimization of surgical practice and medical service appraisal.

PATIENTS AND METHODS

This study has been carried out as a retrospective study of maxillofacial fractures, and was done at Al-Azhar University hospitals (El-

Hussein and Bab El-She'reya), Plastic Surgery department, Faculty of Medicine, Cairo at the period from 2014 to 2017, the study was approved by the Ethics Board of Al-Azhar University.

In this study 76 patients were involved, including both sex, all age groups, all fracture sites, different causes of trauma and different treatment modalities. We analyzed their medical records and data were collected concerning sex, age, cause of injury, type of fracture, treatment modality, and postoperative complications.

All patients were subjected to history taking as regard personal history including; name, age, sex, residence and occupation, also the complaint on admission and if there is present complaint, also as regard investigations were done, then all patients were subjected to complete maxillofacial examination.

Statistical methods

The collected data was revised, coded, tabulated and introduced to a PC using Statistical package for Social Science (SPSS 15.0 for windows; SPSS Inc, Chicago, IL, 2001). Data was presented and suitable analysis was done. Descriptive statistics: mean, standard deviation (\pm SD), minimum and maximum values (range) for numerical data, frequency and percentage of non-numerical data.

Analytical statistics: Chi-Square test was used to examine the relationship between two qualitative variables, statistical significance was considered when probability (P) value was less than or equal to 0.05.

RESULTS

The mean age in studied patients was (24.84 \pm 10.57) years with minimum age of 4 years and maximum age of 61 years (**Table 1**).

Sex distribution was 70 (92.1%) male and 6 (7.9%) female, with a male-to-female ratio of 11.6:1 (**Table 2**).

There is statistically significant difference (p -value < 0.05) between age groups as regard sex, the second (28 cases) and third decades (29 cases) groups of age in both sexes were more likely to sustain facial fractures (**Table 7**).

As regard trauma type in studied patients. 32 patients (42.1%) were road traffic accident, 22 patients (28.9%) were violence, 20 patients (26.3%) were falls and 2 patients (2.7%) were gunshot (**Table 3**).

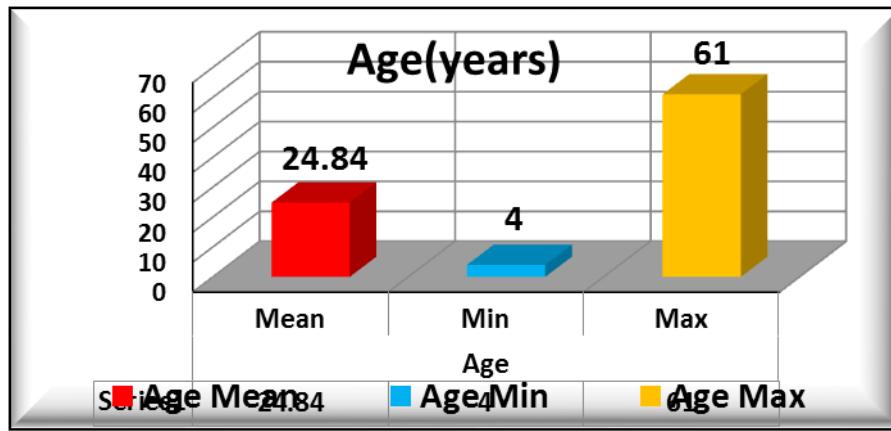
As regard fracture site in studied patients. 43 patients (56.5%) were mandibular fractures (41 males and 2 females), 10 patients (13.2%) were zygomatic fractures (9 males and female), 5 patients (6.6%) were nasal bone fracture (5 males), 9 patients (11.8%) were maxillary fractures (8 males and female) and 2 patients (2.6%) were frontal bone fracture (both are males), while 7 patients (9.2%) were pan facial fracture (6 males and female) (**Table 4**).

As regard treatment modalities in studied patients. 67 patients (88.2%) were treated by Open reduction internal fixation (ORIF), 6 patients (7.9%) were treated by Mandibulo-maxillary fixation (MMF) while 3 patients (3.9%) were treated by Splinting (**Table 5**).

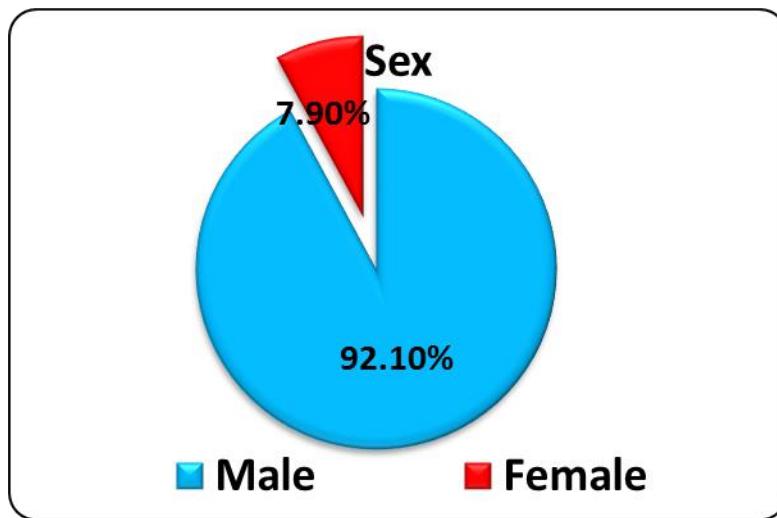
As regard post-operative complications in studied patients. 69 patients (90.9%) had no complications, 2 patients (2.6%) had infection, 3 patients (3.9%) had malocclusion and 2 patients (2.6%) had paresthesia, there were 3 cases subjected for redo due to malocclusion (**Table 6**).

Table (1): Description of age in studied patients

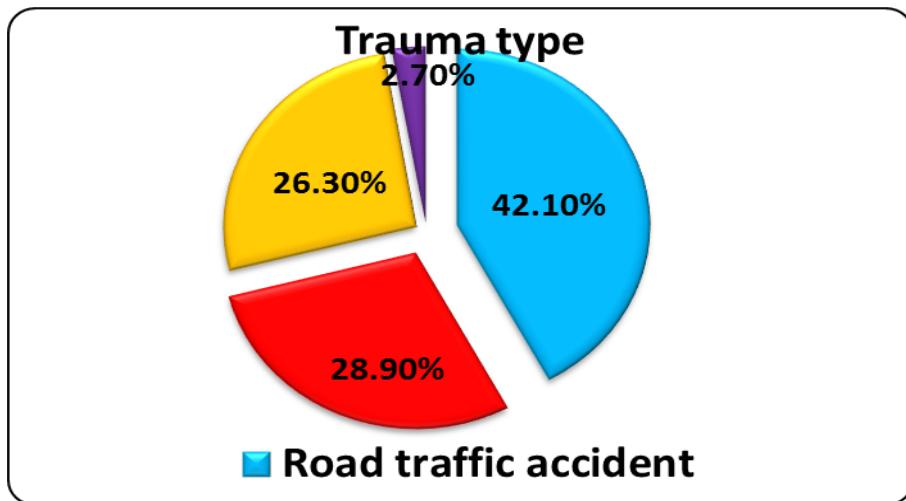
| Variable | | Studied patients N = (76) |
|------------------------|---------------------------|----------------------------------|
| Age (years) | Mean | 24.84 |
| | \pmSD | 10.57 |
| | Min | 4 |
| | Max | 61 |

**Figure (1):** Description of Age in studied patients.**Table 2:** Description of sex in studied patients.

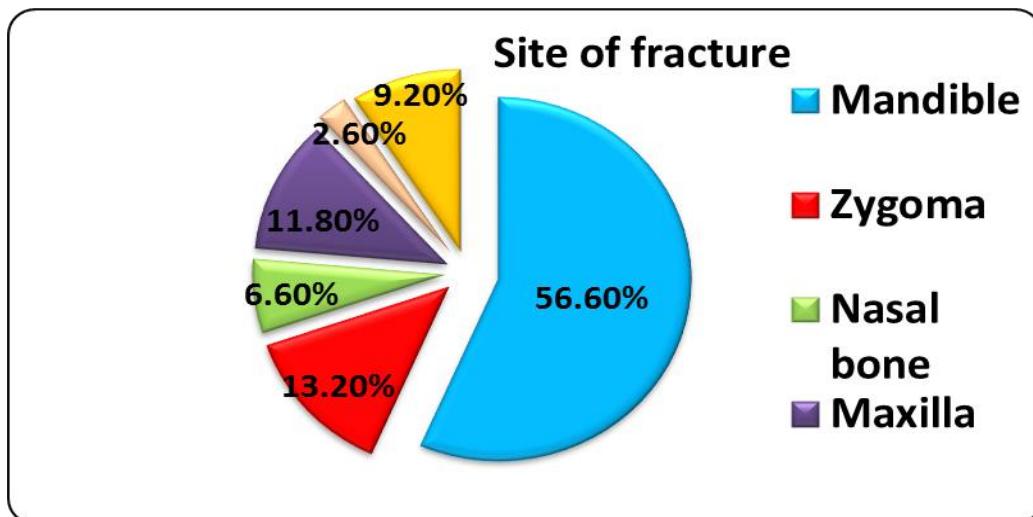
| Variable | | Studied patients N = (76) |
|----------|--------|---------------------------|
| Sex | Male | 70 (92.1%) |
| | Female | 6 (7.9%) |

**Figure 2:** Description of Sex in studied patients.**Table 3:** Description of trauma type in studied patients

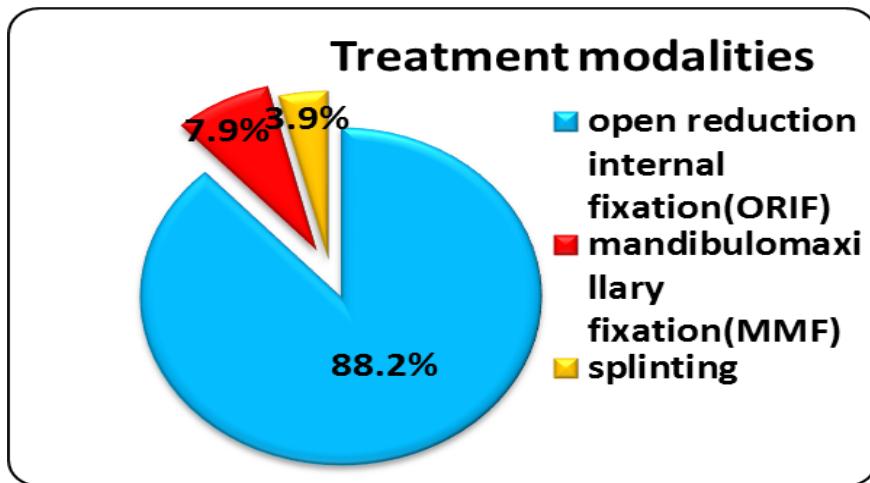
| Variable | | Studied patients N = (76) |
|-------------|-----------------------|---------------------------|
| Trauma type | Road traffic accident | 32 (42.1%) |
| | Violence | 22 (28.9%) |
| | Falls | 20 (26.3%) |
| | Gun shot | 2 (2.7%) |

**Figure 3:** Description of Trauma type in studied patients.**Table 4:** Description of site of fracture in studied patients.

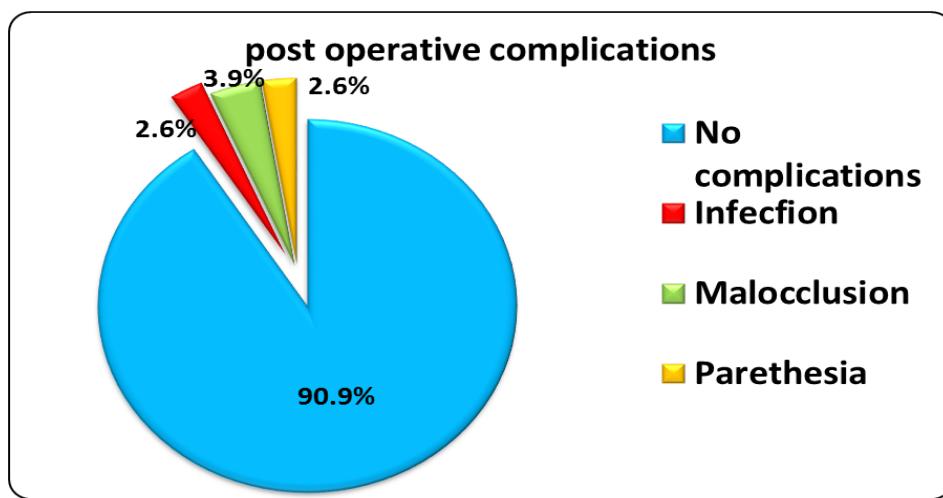
| Variable | Studied patients N = (76) |
|------------------|---------------------------|
| Site of fracture | Mandible |
| | 43 (56.6%) |
| | Zygoma |
| | 10 (13.2%) |
| | Nasal bone |
| | 5 (6.6%) |
| Maxilla | 9 (11.8%) |
| | Frontal |
| Pan facial | 2 (2.6%) |
| | 7 (9.2%) |

**Figure 4:** Description of Site of fracture in studied patients.**Table 5:** Description of treatment modalities in studied patients.

| Variable | Studied patients N = (76) |
|----------------------|--|
| Treatment modalities | Open reduction internal fixation(ORIF) |
| | 67 (88.2%) |
| | Mandibulo-maxillary fixation(MMF) |
| Splinting | 6 (7.9%) |
| | 3 (3.9%) |

**Figure 5:** Description of Treatment modalities in studied patients**Table 6:** Description of post-operative complications in studied patients

| Variable | Studied patients N = (76) |
|------------------------------|---------------------------|
| Post-operative complications | No complications |
| | Infection |
| | Malocclusion |
| | Paresthesia |

**Figure 6:** Description of post-operative complications in studied patients.

Age and gender distribution of patients shows that; age group(0-10 years) there were 3 males and no females, group (11-20 years) there were 24 males and 4 females, group (21-30 years) there were 28 males and 1 female, group (31-40 years) there were 9 males and no females, group (41-50 years) there were 5 males and no females, group (51-60 years) there was 1 female and no males and group >60 years there was 1 male and no females.

Table (7): Age and gender distribution of patients

| | 0-10 | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | > 60 | p-value |
|--------|----------|------------|------------|----------|----------|----------|----------|---------|
| Male | 3 (100%) | 24 (85.7%) | 28 (96.6%) | 9 (100%) | 5 (100%) | 0 (0%) | 1 (100%) | 0.02 |
| Female | 0 (0%) | 4 (14.3%) | 1 (3.4%) | 0 (0%) | 0 (0%) | 1 (100%) | 0 (0%) | |

Table (7) shows statistically significant different (p-value < 0.05) between these groups as regard sex.

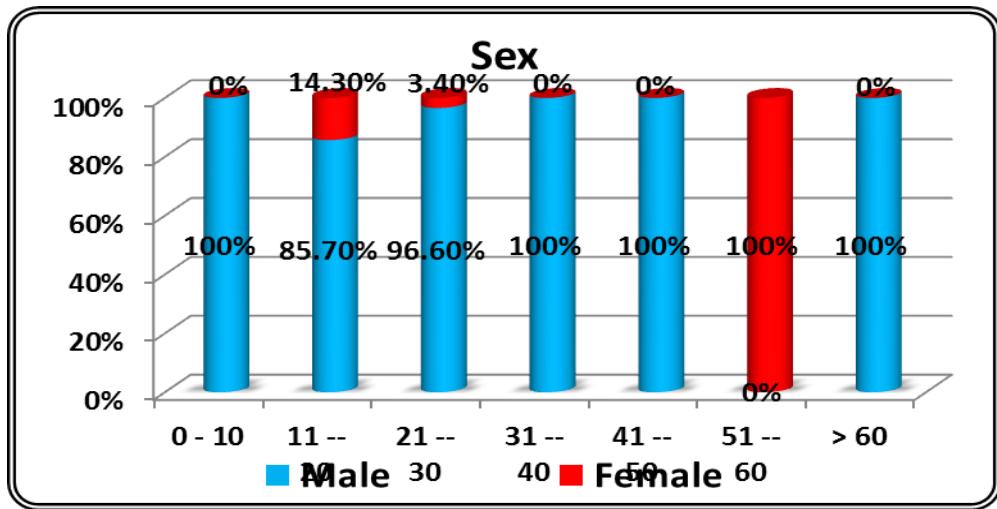


Figure 7: Description of age and gender distribution of patients.

DISCUSSION

Maxillofacial fractures have now become a public health issue in many parts of the world. Epidemiologic surveys in different countries have revealed factors such as geographical location, culture, socioeconomic status and means of transportation as influential factors affecting the incidence and etiology of maxillofacial fractures⁽⁷⁾.

Many studies all over the world had been conducted to study the epidemiology and characteristics of maxillofacial trauma such as **Gassner et al.**⁽³⁾ and **Ozkaya et al.**⁽⁸⁾.

There are very few studies regarding the Egyptian population as **Sakr et al.**⁽⁹⁾ **Mabrouk et al.**⁽⁴⁾ and **Melek and Sharara**⁽¹⁰⁾.

This study was done to review the different epidemiological features of maxillofacial fractures as the incidence, cause, and site of fracture and patients' data as age, sex, and also surgical procedures and postoperative complications.

As for sex distribution in the present study, the male population was more frequently affected, accounting for 92.1% (70 cases) and the female population accounted for just 7.9% (6 cases) almost attaining a male-to-female ratio of 11.6:1 higher than other studies as in Chandra and Reddy 2008⁽¹¹⁾ the ratio was 4.7:1 and in Egypt as in **Mabrouk et al.**⁽⁴⁾ the ratio was 5.7:1.

This male dominance reflects cultural and/or employment differences in our community and express the probability of exposure of male to high risk jobs and outdoor daily life risks that could lead to facial injuries.

The second (28 cases) and third decades (29 cases) groups of age in both sexes were significantly more likely to sustain facial fractures. That is because it is the energetic period of life where an individual takes part in hazardous sports, fast driving, and more likely to be involved in violence acts.

This agrees with **Cheema and Amin**⁽¹²⁾ where the second and third decades are most affected and **Oginni et al.**⁽¹³⁾ where third decade group of age are most affected.

In our study the most common cause is road traffic accident (32 cases) followed by violence (22 cases) and falls (20 cases), this agrees with **van den Bergh et al.**⁽¹⁴⁾.

Other studies stated that violence followed by road traffic accidents are the most common causes of maxillofacial fractures as **Lee et al.**⁽¹⁵⁾.

In developed countries, progress in technology has resulted in more personal and vehicle protective measures being implemented in addition to access to proper medical care, good road and transport facilities, and regular enforcement of traffic rules and regulations, while in developing countries entry into opposite traffic lane without regard, violation of the right of the way occurs⁽¹⁶⁾.

In our study, a mandibular fracture were the most common among all other sites accounting for 56.6% of all fractures as mentioned in many other studies as **Kapoor and Kalra**⁽¹⁷⁾ where mandibular fractures are most common and constitutes 63%.

However; this is not corresponding with other studies that found that nasal bones and

zygomaticomaxillary complex the most common site of injury due to their prominent position within the facial skeleton as **Leles *et al.*** (18) and **Eggensperger *et al.*** (19).

In our study, open reduction and internal fixation with mini plates was the most commonly used method, while mandibulomaxillary fixation alone and splinting were used in about 11% of cases.

The most frequent postoperative complications after treatment of maxillofacial fractures are malocclusion, infection, and nonunion (20), while we had post-operative complication rate 9.1% (7 cases); the complications were malocclusion in three cases and were subjected for correction surgery, infection in two cases and was treated by antibiotics and paresthesia in two cases.

CONCLUSION

Road traffic accidents are the main etiological factor in maxillofacial injuries, with men between 11 and 30 years of age being affected predominantly, fracture mandible is the most frequent and open reduction with internal fixation is the treatment modality that is mostly used with outcome of non-complicated cases up to 91%.

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